



The Birth Month Paradox (Experimental Pr)

How to Get a Random Sample from CensusAtSchool

Go to the CensusAtSchool [Random Sampler](#) to download a sample.X

Reference year: (select year)

Sample size: 35 students

Select questions: Birth month

Location: Select location

Year level:

(select a range of year levels)

To protect privacy there is a rule built into the sampler that the requested sample size cannot exceed 10% entered.

Task:

A paradox is something that seems impossible but is, in fact, true.

1. Imagine a random group of 5 people. What do you estimate would be the chance that at least 2 of them were born in the same month? Mark with an 'E' on the probability scale.

0 _____ 0.5
1.0

2. If someone told you that it could be theoretically proven that the chance that, in any randomly selected group of 5 people, the probability that at least 2 of them have the same birth month is greater than a half would you believe them?
i.e. (Pr at least 2 people out of 5 have the same birth month) = >0.5

You can check whether this is true by conducting an experiment using data from your random sample. Look at the birth months in your list. The first five students are student 1 to student 5. The second group of five students is student 2 to student 6 and so on. If there is a repeated birth month this is a favourable outcome.

3. Record whether there was a match for each group in a table like the one below for 30 trials. If there is more than one match this is still recorded as a single favourable outcome. Keep a running record of the fraction (how many favourable outcomes out of the total number of groups) and the percentage.

Group	Favourable outcome Y or N	Fraction	Decimal
1.		$\frac{1}{1}$	



2.		$\frac{1}{2}$	
3.		$\frac{1}{3}$	
4.			

4. Use a '**T**' to record your result after 30 trials on the probability scale in question 1.

You may notice that the more results we collect the less variable our results become.

5. Find the fraction and percentage when you pool your results with 1 classmate (a fraction out of 60) or 2 classmates (a fraction out of 90) in your class. Use a '**G**' to show the result on the scale.

6. Write a paragraph that explains your findings to someone who doesn't know about the Birth Month Paradox.

NOTE: CaSQ 9B is an extension to this activity